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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

NGUYEN, TU MINH

ART UNIT

PAPER NUMBER

3748

NOTIFICATION DATE

DELIVERY MODE

01/28/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/561,835	Applicant(s) UEDA ET AL.	
	Examiner TU M. NGUYEN	Art Unit 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,7,8 and 10-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,7,8,10,11 and 13-15 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. An Applicant's Amendment filed on October 7, 2009 has been entered. Claims 5, 6, and 9 have been canceled; and claims 1, 2, 10, 13, and 14 have been amended. Overall, claims 1-4, 7, 8, and 10-15 are pending in this application.

Claim Objections

2. Claim 1 is objected to because on line 8 of the claim, "and" should be deleted. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 7, 8, 10, 11, 13, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Silva (U.S. Patent 4,606,319).

Re claim 1, as shown in Figures 1-5, Silva discloses a fuel fractionation method for an internal combustion engine (1), comprising the steps of:

- applying an operation for promoting a fractionation of a fuel of the internal combustion engine to a fractionation passage (6) while making the fuel flow to the fractionation passage,

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thereby fractionating the fuel into a gas phase fuel and a liquid phase fuel within the fractionation passage (see line 33 of column 6 to line 53 of column 7);

- conducting the fractionated gas phase fuel and the fractionated liquid phase fuel to a branch point (11) of the fractionation passage;

- separating (see Figure 5) the gas phase fuel and the liquid phase fuel to an upper branch passage (34) and a lower branch passage(42) , respectively due to gravity;

- applying a heat operation to the fractionation passage by utilizing exhaust heat wasted from the internal combustion engine from the operation for promoting the fractionation of the fuel (see the Abstract and line 63 of column 6 to line 8 of column 7); and

- adjusting a temperature of the branch point (11) of the fractionation passage so that the temperature of the branch point of the fractionation passage is maintained at a predetermined target temperature (see at least lines 7-24 of column 2 and line 49 of column 8 to line 34 of column 9).

Re claim 2, as depicted in Figures 1-5, Silva discloses a fuel fractionation apparatus for an internal combustion engine (1), comprising:

- a fractionation passage (6) which is connected to a fuel supply system of the internal combustion engine and reaches a branch point (11) of a terminal end through a fractionation section to which a fractionation promoting effect of a fuel is applied;

- a liquid phase branch passage (42) which is branched to a lower side from the branch point;

- a gas phase branch passage (34) which is branched to an upper side than the liquid phase branch passage from the branch point;

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- a temperature detecting device (see lines 3-5 of column 9) for detecting a temperature of the branch point;

- a temperature adjusting device (19, 9, 4) adapted for adjusting the temperature of the branch point; and

- a temperature control device (17, 55) for controlling an operation of the temperature adjusting device based on the temperature detected by the temperature detecting device such that the temperature of the branch point is maintained at a predetermined target temperature; wherein

the fractionation section extends through an area (5) to which a heating operation is applied due to a heat wasted from the internal combustion engine as the fractionation promoting operation, and

an exhaust heat of the internal combustion engine is utilized as the heat wasted from the internal combustion engine.

Re claims 3-4, in the apparatus of Silva, an inlet of the liquid phase branch passage (42) is provided with a gas phase fuel inflow inhibiting portion (43) for inhibiting the gas phase fuel from flowing into a downstream side of the liquid phase branch passage due to an existence of the liquid phase fuel, wherein an orifice is provided in the gas phase fuel inflow inhibiting portion.

Re claim 13, in the apparatus of Silva, the fractionation section (6) is provided within the exhaust passage (23, 24) of the internal combustion engine (see Figure 2), and the branch point (11) is provided in an outer side of the exhaust passage.

Re claims 7, 8, and 15, the apparatus of Silva comprises a pressure regulating device (16) for regulating a pressure within the fractionation passage as a device for generating the

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fractionation promoting operation; and a pressure control device (17, 55) for controlling an operation of the pressure regulating device based on a temperature of the fuel flowing through the fractionation passage (see lines 3-18 of column 9), wherein the fractionation section is provided so as to carry out heat exchange between the fractionation section and an engine main body (10, 24) surrounding a combustion chamber in the internal combustion engine.

Re claims 10-11, in the apparatus of Silva, the temperature adjusting device changes a flow rate of the fuel conducted to the fractionation section so as to adjust the temperature of the branch point (see lines 3-18 of column 9), and wherein the temperature control device operates the temperature adjusting device such that the flow rate of the fuel conducted to the fractionation section is limited to a minimum value when the temperature detected by the temperature detecting device deflects from an allowable range with respect to the target temperature.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Silva as applied to claim 5 above.**

The apparatus of Silva discloses the invention as cited above, however, fails to disclose that an exhaust gas purifying device is provided in the exhaust passage of the internal

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combustion engine, and the fractionation section is provided so as to carry out heat exchange between the fractionation section and the exhaust passage in a downstream side of the exhaust gas purifying device.

With regard to applicants claim directed to the placing the fractional section at a downstream location of an exhaust gas purifying device, the specification of such would have been an obvious matter of design choice well within the level of ordinary skill in the art depending on design variables, such as the availability of spacing in the exhaust passage, etc. Moreover, there is nothing in the record which establishes that the specification of such presents a novel of unexpected result (See *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975)).

Allowable Subject Matter

7. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments with respect to the references applied in the previous Office Action have been fully considered but they are not persuasive.

In response to applicant's argument that Silva fails to disclose a temperature control device for controlling an operation of the temperature adjusting device based on the temperature detected by the temperature detecting device such that the temperature of the branch point is

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maintained at a predetermined target temperature (pages 8-9 of Applicant's Amendment), the examiner respectfully disagrees.

During operation of the fuel fractionation apparatus in Silva, the fuel portions in the fractional passage (6) and in the branch point (11) are in direct fluid communication with each other. Furthermore, the fuel is in a saturated state in both devices; therefore, it is clear a detected temperature in the fractional passage is about the same as that in the branch point.

The text on lines 16-24 of column 2 in Silva reads as follows: *"A still further object of the invention is to provide an improved, novel system and method for introducing vaporized, liquid fuels into an internal combustion engine wherein two or more distinct liquid fuels having different temperatures of vaporization may be introduced into the system at random or in mixtures, and each fuel will be automatically vaporized at its optimum vaporization temperature without any mechanical adjustment of the system being necessary."* (emphasis added by examiner)

Based on the above disclosure, Silva knows in advance the optimum vaporization temperature of each of a plurality of fuels; and Silva is adapted to operate the thermal switches and valves so that an optimum vaporization operating temperature in the fractional passage or the branch point is achieved. As admitted by applicant (see page 9 of the Amendment) and indicated on lines 3-18 of column 9 of Silva, Silva operates to open the valves (19, 9) and to activate fuel pump (4) when a temperature of the fractional passage (6) reaches a preset temperature, which triggers the thermal switch (17) to open. The above "preset temperature" is the optimum vaporization temperature of a particular fuel in use at that time. Since Silva indicates that there are two or more types of fuel in the apparatus, it is clear that Silva clearly discloses a temperature

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control device for controlling an operation of the temperature adjusting device based on the temperature detected by the temperature detecting device such that the temperature of the branch point is maintained at a predetermined target temperature.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Communication

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Tu M. Nguyen/

TMN

Tu M. Nguyen

January 22, 2010

Primary Examiner

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